

Supplement to INFORMATION LETTER

NATIONAL CANNERS ASSOCIATION

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Raw Products Research Activities

EXPERIMENT STATION REPORTS

Problems now under study at State Agricultural Experiment Stations affecting crops grown for canning are briefly reviewed in this Supplement to the INFORMATION LETTER. No attempt is made to report the results of experiments in full; rather the purpose is to indicate the scope of work now being done by these agencies that is of particular interest to canners.

In many cases the Raw Products Bureau has been in close touch with the work since its beginning and can suggest to individual members, through correspondence, ways by which canners may apply the results of agricultural research in the improvement of crop yield and quality.

ARKANSAS

33d Annual Report, Arkansas Agricultural Experiment Station, Fayetteville. Bul. 417.

PEACHES FOR CANNING

The great bulk of the Arkansas peach crop is at present produced for fresh market. As a possibility for expanded market outlets of the State's crop, the canning qualities of some of the more promising Arkansas-grown varieties have been investigated by workers at the Station. They found that the Chilow and Elberta varieties are the most promising of the 15 varieties tested for canning qualities.

CONNECTICUT

Annual Report, Connecticut Agricultural Experiment Station, Year Ending Oct. 31, 1941, New Haven. Bul. 452.

DUSTING SWEET CORN FOR CONTROL OF EUROPEAN CORN BORER

Control work on a commercial basis during 1941 gave encouraging results. One acre of extra early sweet corn, dusted according to a standard schedule, yielded a net return above dusting cost of \$159 more than the return from an untreated acre. Since similar results were obtained in 1940, the treatment of early sweet corn to control the borer appears to be economically sound. However, from a standpoint of both economy and efficiency the methods of control now in use will stand improvement.

During the last two years the habits of the borer in the corn plant have been studied with the object of improving control methods. These observations suggest that the first application of an insecticide should be made when the plant reaches the stage just prior to the appearance of the tassel tip inside the whorl. It would seem that the application of sprays or dusts to the developing ears alone should give good control, but field tests of this have given conflicting results.

SQUASH VINE BORER CONTROL

Rotenone dust, applied at weekly intervals, appeared to be the most effective of the materials used for control of this insect.

BET COLOR AND SUGAR CONTENT

Studies are being made of the effect of environmental influences on the pigment and sugar content of garden beets. Data have been accumulated to show the effects of soil and nutritional differences.

SWEET PEPPER BREEDING

Success with the project to develop an early thick-fleshed, deep red, productive sweet pepper is at hand. Fourth and fifth generation selections from hybrids in which Windsor A and B were crossed with Oshkosh will be grown at Mount Carmel in 1942 in picking trials for final selection and for seed increase.

TOMATO BREEDING FOR DISEASE RESISTANCE

Several lines have been developed with standard vines and handsome fruit. One of these lines has the characteristic of being able to keep the fruit covered with new foliage, even when the older leaves are killed by the alternaria leaf spot. New shoots come out along the main stems in sufficient numbers to shade the exposed fruit and to supply food for the immature fruit.

FLORIDA

Annual Report, Florida Agricultural Experiment Station, Fiscal Year Ending June 30, 1941, Gainesville.

BREEDING TOMATOES RESISTANT TO "PUFFING" AND WILT

A breeding program designed to produce an acceptable tomato variety for Florida which also is resistant to "puffing" is being conducted. The puff-resistant parent of hybrids being tested is Prairiana.

Two new Fusarium-wilt resistant tomato varieties were released: Ruby Queen, a pink, and Cardinal King, a red. Both are heavy-vined varieties for spring planting.

LIMA BEAN SEED TREATMENT

In the lima bean experiment Spergon was outstanding not only because it produced a higher percentage germination of seed but also because of the effect it had upon plant development. In the first place, it did not harden the seed coat as did cuprocide and zinc oxide; in fact, it made the coats softer than those of the untreated seed, giving a higher percentage of normal plants. The cotyledons and stems of plants treated with Spergon remained smooth and green longer after emergence, and the stems showed fewer Rhizoctonia lesions than those treated with cuprocide and zinc oxide.

In a test conducted in April when the mean temperature was relatively high, Ceresan applied to Fordhook lima bean seed at the rate of $\frac{1}{4}$ per cent, and Spergon at $\frac{1}{2}$ per cent by weight, gave highly significant improvement in germination.

CITRUS STUDIES

A number of projects to study control of diseases and insects affecting citrus are under way at this Station. Variety tests are also being conducted; and effect of nutritional treatments on quality are being studied.

GEORGIA

54th Annual Report, 1941-42. Georgia Experiment Station, Experiment.

BREEDING BEANS FOR RESISTANCE TO ROOT ROTS

Work is under way to develop strains sufficiently resistant to root rots and nematodes to give more than the usual one good picking. So far a few strains and the progenies of a few individual plant selections have shown some indication of the desired resistance.

BREEDING TOMATOES FOR DISEASE RESISTANCE

During the summer of 1941, ten tomato selections from the hybrid received from the Regional Vegetable Breeding Laboratory at Charleston, S. C., and 23 selections made at this Station, were grown in a field heavily infested with both root-knot nematode and Fusarium wilt. When final notes were taken in November, all local selections showed severe injury by nematodes and wilt, while two of the hybrids had no dead plants and still were growing vigorously. In one of these, the roots of all except one plant were heavily infested with root-knot and two plants showed slight discoloration of the roots by Fusarium, while in the other strain, all appeared to be almost immune to both nematode and wilt.

USE OF A BOOSTER SOLUTION IN TRANSPLANTING PIMIENTO PLANTS

A pint of a transplanting or booster solution, consisting of four pounds of a mixture of two parts of amo-phos and one part of nitrate of potash dissolved in 50 gallons of water, used around pimiento plants at setting time, resulted in slightly better stands and 341 pounds per acre more marketable fruit than where plain water was used in setting. A basic application of 600 pounds per acre of an 8-8-6 fertilizer was applied in the row and mixed well with the soil several days before the plants were set out.

SNAP BEAN TRIALS

Forty-one snap bean selections made by the U. S. Regional Vegetable Breeding Laboratory at Charleston, S. C., were planted at Experiment on April 23. Several selections have been made from this group on the basis of color, type, freedom from strings, and yield. One selection in particular seems very promising as a canning bean for this immediate section of Central Georgia.

PEACH FERTILIZER TESTS

After 11 crop years, the Elberta peach fertilizer tests involving various increments of nitrogen were concluded. As shown in a table, the yields increased as the amount of nitrogen in the fertilizer increased. Apparently an 8-8-6 fertilizer is approaching the limit as regards yields at which fertilizer may profitably be applied. Maturity of the fruit is delayed progressively with increased nitrogen application,

but the color was considered good on all plats with the exception of the plats receiving a 12-8-6 fertilizer.

Taking into consideration the yields, maturity, and color, the best fertilizer used in these experiments is six pounds of a 4-8-6 fertilizer per mature tree on March 1, supplemented with 1.4 pounds of nitrate of soda in June, or sufficient nitrogen to bring up the total application to an equivalent of an 8-8-6 fertilizer.

USE OF HORMONES ON PEACHES

Preliminary results from application of naphthalene acetic acid on early peaches showed that it was effective in reducing the preharvest drop. In addition to the reduction in drop, the peaches developed better quality and higher color, and were firmer than peaches from adjacent check trees. Fruit from the trees sprayed with naphthalene acetic acid seemed to have better shipping quality than from unsprayed trees.

GEORGIA COASTAL PLAIN

21st Annual Report, 1940-41. Georgia Coastal Plain Experiment Station, Tifton. Bul. 32.

TOMATOES

The following tests are in progress at this Station with tomatoes: Spacing; fertilizer formulas; rates of applying fertilizer; sources of phosphoric acid, nitrogen and potash; controlled plant nutrient study; top dressing test with nitrogen and with potash; ratios of mineral and organic nitrogen; and comparative value of stable manure and commercial fertilizer.

The tomato seedling disease investigations included study of the relationship of plant age and mechanical injury to susceptibility to infection, and the relation between plant nutrition and disease susceptibility.

MAINE

Maine Agricultural Experiment Station, Orono. Bul. 411-B.

BEAN BREEDING

Several selections made from the crosses Hercules x Conserva and Hercules x Brittle Wax appear to have promise both for canning and for frozen pack. These strains are being continued for further tests.

BEAN VARIETY TRIALS

Among the newer snap beans, the Tenderpod variety was excellent in quality but was somewhat low in yield. The Streamliner and the World's Fair varieties produced high yields but were of inferior quality.

MEXICAN BEAN BEETLE CONTROL

The early application of an insecticide served to prevent feeding by the adult beetles. Such young larvae as hatched from the eggs on treated plots were killed before they were large enough to cause extensive injury to the beans. It is recommended that insecticides be applied from June 10 to June 20, depending upon when the beetles first appear. Effective insecticides, carefully applied during the summer and fall months, will diminish the number of beetles which seek winter hibernating quarters to a point lower than what may be expected when insecticides are not applied.

Data on hand indicate the value of properly mixing dusts and sprays and applying them carefully to the bean plants. A number of insecticides were tested.

PEA APHID CONTROL

Evidence from research indicates that satisfactory control of this insect depends not alone on the use of an effective insecticide but also involves the proper timing and careful application of the materials used. Timing of the application to coincide with calm, warm weather when rain is not likely to occur immediately, has resulted in the most satisfactory control of pea aphids.

A rotenone dust, made up according to one of the following formulas, was effective in the control of aphids:

Formula No. 1: Ground derris root to insure rotenone content of one per cent; a wetting or spreading agent (such as peanut or soya oil), two per cent; and an inert carrier. A combination of Celite and talc makes a good carrier.

Formula No. 2: Ground derris root to insure rotenone content of one per cent; a wetting or spreading agent, one per cent; terpene ether, four per cent; and an inert carrier.

TOMATO VARIETIES

Stokesdale was outstanding in general quality in the variety plots for a main crop tomato. Victor and Bounty were not the earliest, but both produced heavy early crops. Early Danmark was noteworthy for its early yield of smooth, nearly crack-free fruit.

MASSACHUSETTS

Annual Report, Massachusetts Agricultural Experiment Station, Fiscal Year Ending Nov. 30, 1941, Amherst. Bul. 322.

LIMA BEAN SEED TREATMENT

The value of a number of dry chemical powders in preventing pre-emergence damping-off and seed decay of lima beans was determined. Spergon-treated seed produced a larger number of seedlings and consequently a greater yield of lima beans than seed receiving any other treatment or no treatment. The second best treatment was red copper oxide, which held a slight advantage in number of seedlings and yield over zinc oxide. Semesan was distinctly injurious to the seedlings, the injury persisted throughout the growing season, and the yield was materially reduced. Although more seedlings grew from seed treated with Semesan than from untreated seed, the total yield from untreated seed was nearly twice that from Semesan-treated seed.

CRANBERRY STUDIES

At the East Wareham Station, studies are being carried on relating to insect control, control of cranberry bog weeds, and development of strains of cranberry resistant to false blossom.

SQUASH VINE BORER CONTROL

Experimental sprays and dusts were applied for control of this insect July 7, 14, 21 and 28. The sprays were applied at 275 pounds pressure with a small power sprayer and the dusts with a plunger type hand duster. The most effective treatments were a rotenone-copper oxychloride sulfate dust, white oil emulsion (one per cent) with nicotine sulfate 1-500 spray, and nicotine sulfate 1-250 spray. Rotenone-talc dust containing 0.75 per cent rotenone and a dust containing 20 per cent cryolite with five per cent metallic copper, were moderately effective. Lead arsenate (three pounds) with fish oil (one pint) in 100 gallons of water as a spray was ineffective, this plot having an infestation only 12 per cent less than the untreated check. Yield records showed a signifi-

cant increase in favor of the dusted plants, reflecting the beneficial action of a fungicide on the production of fruit. The plants receiving the rotenone-copper oxychloride sulfate dust yielded 594 pounds more than the untreated check, an increase of 80 per cent. As in previous experiments, there was no consistent direct correlation between yield and borer injury. The 1941 experiments also strengthened the theory that an infestation of two borers or less per vine before August 1 does not greatly reduce the yield.

SWEET CORN BREEDING

The object of the corn breeding program has been to develop a hybrid which would provide earliness, productivity, disease resistance, and quality. During the past five years a system of inbreeding has been practiced in an effort to obtain superior inbred lines with characteristics which are sought in the hybrid. Approximately 100 such inbred lines have been obtained, and the work now consists of testing the inbreds in various combinations of crosses to ascertain which of the combinations are most desirable.

During 1941, 40 such combinations were planted and carefully studied through the growing period. Five of these performed especially well and have been recommended for further trial. If they grow and produce as well in another season, the seed stock will be multiplied and sent out for trial among a number of vegetable growers.

HYBRID SWEET CORN TRIALS

Tests conducted at this Station for the past three years to observe earliness, yield, quality, disease resistance, and general adaptability of yellow varieties indicate that Spancross, Marcross, Carmelcross, and Golden Bantam are especially noteworthy for the locality.

TOMATO VARIETIES

Stokesdale and Rutgers were particularly outstanding in trials to ascertain the adaptability and general usefulness of newer introductions in comparison with the standard varieties.

TOMATO BREEDING

This experiment has been confined to the problem of incorporating the uniform ripening gene into otherwise desirable tomato varieties.

COLOR OF BEETS

There seems to be a definite correlation between speed of growth and color in beets. The larger roots of the Wyman Crosby strain of beet always seem to be of poor color, while the small roots usually are a dark red color. Twenty-five different selections of single and mass roots were grown and several proved to be very uniform and somewhat of a compromise in that they were of dark color and medium speed of growth. It will require time to build up sufficient seed to try these out on a large scale.

CARROT BREEDING

The F₁ generation of a cross of Hutchinson with a Turkish red carrot was grown. The hybrid material was so promising that several lines will be increased for further testing on a larger scale. These new lines have a very uniformly colored root and have a pleasing external color much darker than the Hutchinson.

MISSOURI

Work of Missouri Agricultural Experiment Station, Year Ending June 30, 1939, Columbia. Bul. 444.

BREEDING TOMATOES FOR RESISTANCE TO FUSARIUM WILT

Breeding work was continued at this Station with the hybrids involving a very resistant strain of currant tomato and various commercial varieties of tomatoes. Additional back crosses to commercial varieties were made and selected individuals were selfed for analysis of segregation of susceptible and resistant plants.

NEBRASKA

53th Annual Report, 1941, Nebraska Agricultural Experiment Station, Lincoln.

ADAPTED VARIETIES OF TOMATOES

In the variety trials, Pearson has been found to be the most satisfactory late tomato for eastern Nebraska.

BREEDING BEANS FOR DISEASE RESISTANCE

The bean breeding program designed to develop horticulturally desirable green bean varieties possessing resistance to halo blight was continued. Results so far obtained indicate that genetic factors for resistance to halo blight may be combined with factors for desirable type, earliness, and yield.

Work also was continued in an effort to produce desirable varieties possessing resistance to common blight. This work has been handicapped by the inability to find completely resistant parents or parents capable of imparting much resistance to the progeny.

NEW YORK

61st Annual Report, New York State Agricultural Experiment Station, Fiscal Year Ended June 30, 1942, Geneva.

PEA APHID CONTROL

The investigations during 1941 were directed largely to a study of concentrated sprays and rotenone-bearing dusts.

The vapofumer, an outfit that vaporizes free nicotine, was found to be the most dependable method available for pea aphid control, and when properly used can be counted on to give the highest and most consistent kill of all the methods used. Its chief drawbacks are the expense, due to the cost of insecticide used, the amount of labor required, and the relatively slow speed of operation.

Nicotine dusting is fairly comparable to vapofuming in effectiveness but is somewhat slower and not so convenient to operate. Rotenone dusting is considerably cheaper than either vapofuming or nicotine dusting, not only in initial cost of the insecticide but owing to greater speed of operation and the use of less labor.

EFFECT OF SEED TREATMENT ON THE GROWTH OF PEA PLANTS

Seed treatment on peas was profitable in spite of the dry season, giving average increases in yields of 200 to 470 pounds of shelled peas per acre. Spergon again showed up to advantage on Surprise, Wisconsin Early Sweet, Gradus, Alderman, and Green Admiral. It also increased the yields of Alaska in one field by 300 pounds per acre in duplicate tests. The effectiveness of this material in increasing yields has been shown to be due to a combination of fungicidal efficiency and growth-stimulating properties. The mercury and copper treatments protect the seed from decay and thereby produce heavier stands and more vigorous plants whenever conditions

favor disease development. Spergon, in addition to this, promotes more rapid growth of the plants by a growth-stimulating action irrespective of whether seed decay occurs.

EFFECT OF PEA SEED PROTECTANTS ON NODULE BACTERIA

Attempts to inoculate chemically treated pea seed with nodule bacteria have shown that all materials are injurious, but only Spergon permitted enough bacteria to survive to secure successful nodulation on plants grown under aseptic conditions in the greenhouse. Red copper oxide, Semesan, two per cent Ceresan, and organic sulfur compounds prevented successful inoculation.

EFFECT OF ENVIRONMENTAL CONDITIONS ON SEED DECAY, DAMPING-OFF, AND ROOT-ROT OF CANNING CROPS

Studies on pea root-rot during the past years have shown that practically all root-rot organisms reported on peas in the United States and from various parts of the world are widely distributed in pea soils of Western New York. Inoculation experiments and field studies have shown the following organisms, listed in order of importance, to be primarily responsible for diseased peas in New York State: *Fusarium solani* v. *martii* f.2, *Pythium ultimum*, *Rhizoctonia solani*, and *Ascochyta pinodella*. None of the other *Fusaria* commonly associated with root-rot were found to cause serious disease under greenhouse or field conditions.

The organisms and disease were found in a wide range of soils with reactions ranging from pH 5.4 to 7.48. A 6-year study of fields on the Station's canning crops farm at Geneva, where peas have been grown over a period of 16 years, showed that the important root-rot organisms were not entirely eliminated by a 3-, 4-, or 5-year rotation. Commercial yields were obtained during favorable growing seasons on properly fertilized fields in spite of the presence of the pathogens. This would indicate that the population of the pathogens had been reduced by the rotations to a point where commercial yields were possible. The importance of a crop rotation along with the proper maintenance of a high fertility level was indicated.

SOIL DEFICIENCIES REDUCE YIELDS OF CANNERY PEAS

In several regions of the State there is much evidence of soil deficiencies that are seriously reducing the yields of cannery peas. Preliminary tests of these deficient soils were made and some large-scale field experiments in four locations conducted in an effort to overcome these limiting factors. There are at least three distinct deficiencies indicated by different abnormal discolorations and drying up of the leaves. More extensive field tests in several different sections would be of great assistance to growers and cannery men.

NEW VARIETIES OF PEAS FOR CANNING AND FREEZING

Studies have indicated that the Early Harvest pea is as well adapted to New York as the early sweets—Surprise and Wisconsin Early Sweet—and that it equals them in yield. Ace matured about two days after Surprise and was a more vigorous grower, but in 1941 did not yield as well as Early Harvest. Canned samples indicated that both varieties were slightly more variable in color than Surprise. Canner King matured in season with Pride, possibly a day later, and yielded at the rate of 4,600 pounds per acre. The quality was somewhat better than that of Pride.

A new variety, Hybrid No. 64, appeared to be a definite contribution for the freezing industry to fill the seasonal

gap between Thomas Laxton and Alderman. It is a semi-dwarf type, very vigorous and productive, substantially double-podded in bearing habit, and for two years has compared favorably with Thomas Laxton in quality.

EUROPEAN CORN BORER

In 1941 the corn borer investigations were State-wide in extent and included the following activities: Observations of seasonal history, relation of clean-up practices to borer abundance, surveys of infestations, and control experiments with insecticides.

In central and western New York the European corn borer is single-brooded, whereas in the eastern part of the State, the insect has two broods each season. Field tests of insecticides were conducted in western New York, in the Hudson Valley, and on Long Island. Nicotine and rotenone dusts and sprays were tested. Although spray treatments have been found to be effective for the control of the newly hatched larvae, certain practical difficulties, particularly the transportation of large quantities of water in a corn field, have prevented the general adoption of this form of control. Of the various dust materials tested, dual-fixed nicotine dust (four per cent nicotine) and one per cent rotenone dust have been the most consistently effective and have not differed greatly in their performances under New York conditions. Much study was given to devising machinery for applying the dusts. A practical outfit for small acreages is a wheelbarrow traction duster, but for larger acreages a tractor duster is more economical of labor. Four insecticide treatments at 5-day intervals are necessary, and ordinarily will cost a total of from \$22 to \$28 per acre, including labor. It would appear that at present the use of dust treatments is definitely profitable if a price of \$1.50 or more per 100 U. S. No. 1 ears can be obtained and a yield of 10,000 or more ears per acre is expected.

CORN EAR WORM

The studies directed at the control of the corn earworm were centered on Long Island where this pest has been causing serious losses in sweet corn. Principal emphasis was placed on the mineral oil-insecticide treatment for earworm control. Numerous tests have indicated that satisfactory control can be obtained by applying 0.5 to 0.6 cc of a U.S.P. mineral oil (viscosity 175 to 210 seconds, Saybolt), containing 0.1 per cent pyrethrins or one per cent dichlorethyl ether, to the silk channels of developing sweet corn approximately one week after silking. Treatments applied earlier than five days after silking caused excessive tip stunting because of the interference with pollination. Treatments made nine days after silking were satisfactory when dichlorethyl ether was used with mineral oil, although the degree of earworm control was less effective when oil-pyrethrin mixtures were used. This method of control ordinarily requires an expenditure of from \$5 to \$10 per acre, most of which is for labor, although the cost of materials may cause part of this variation. Observations of so-called "resistant" varieties of corn were continued. Although some progress was made, there is no immediate relief in sight from earworm injury by means of resistant varieties.

SWEET CORN SEED TREATMENT

In spite of the dry season, treatment of sweet corn seed with New Improved Semesan Jr. and Spergon increased emergence by two to ten per cent and yields by 200 to 300 pounds of green corn in commercial fields.

LIMA BEAN SEED TREATMENT

The treatment of lima bean seed with Spergon increased the emergence by five to ten per cent and yields by 100 to 700 pounds of shelled beans per acre. New Improved Semesan Jr. appeared to be safe and effective in these tests. Tetramethyl-thiuram-disulfide has shown distinct promise as a seed protectant in greenhouse tests and has not been injurious to lima beans.

It is reported from Long Island that during the years this work has been carried on, a number of materials have been used in an effort to find something which might be of value in improving stands and increasing yields. The variety Fordhook has been used throughout these tests since this variety is grown almost exclusively on Long Island.

Neither Semesan Jr. nor Spergon injured the seedlings in any way and were the only treatments used which proved to be of any value in improving the stand, and even with these the results were erratic. Under adverse conditions the stand has been improved to a certain extent with these materials. In spite of the increased stand obtained under certain conditions by treatment with these materials, the yield of marketable beans has very seldom been increased as a result of treatment when the results have been based on weight of beans.

TESTING OF CANNING AND MARKET VARIETIES OF TOMATOES

Tests of the leading varieties of tomatoes included canning varieties, early market varieties, yellow-fruited sorts, and several of the small-fruited Italian-type tomatoes suitable for canning whole. Of the canning varieties, Bonny Best, Nystate, Geneva John Baer, Stokesdale, Cobourg, and Landreth gave highest early and total yields and fruit of desirable color and quality.

For early market fruit, Bounty yielded better than Victor and averaged larger fruit. These varieties can be planted 3 x 3 feet and will produce good pickings during August. Valiant and Stokesdale for early and main crop can be depended upon for a continuous supply of well-colored, large-sized fruits. Rutgers gave the best yield of the late varieties.

IMPROVEMENT OF VARIETIES OF CANNING BEANS

A comparison of the new variety Sensation showed yields about equal to the standard mosaic-resistant Refugee beans Idaho and U. S. No. 5. In this group a new unnamed hybrid produced only about two-thirds the yield of the above-named varieties but showed considerable promise for shape, length, and size of pod. Two new wax-podded hybrids compared very favorably with the standard variety Brittle Wax.

In addition to the above varieties, a total of 20 new hybrid beans were sent in for trial by the U. S. Department of Agriculture, by the Department of Genetics at Cornell University, and by various seedsmen. Yields and records on the pod characters were taken in order to secure information on the value of these stocks when grown under New York conditions.

From the U. S. Department of Agriculture seed a number of crosses of leading bean varieties were planted at Geneva. This work has as its objective the procurement of a new variety with white seeds and with pods of darker green color than the now existent Refugee types.

The Blue Lake pole bean grown in the Northwest was again planted for yield tests. Since this variety is late in season and reaches its heaviest yielding period in Septem-

ber after the regular bean season closes, six early strains were planted for comparison. These produced between one-half to two-thirds the yields of the regular Blue Lake. They also lacked vigor and the ability to climb. A certain amount of bean rust appeared in these plantings. This coincided with a severe infestation which occurred in a field of Blue Lake.

SQUASH BREEDING

Although the original objective of this project was to develop superior varieties for canning, improved types for market also are being sought. The first group of eight fifth-generation experimental hybrids was grown last year to secure yield and semi-commercial canning records. As the result of these tests, selections A, B, and F were considered to be the most promising and are being grown in small test plots with commercial growers this year. These also are to be processed by dehydration to determine their value for this purpose.

OREGON

Biennial Report 1938-40, Oregon Agricultural Experiment Station, Corvallis, Bul. 401.

CHERRY FRUIT FLY CONTROL

Losses to growers and packers of cherries may be greatly reduced by the discovery by the Department of Entomology of methods of applying lead arsenate sprays to control the cherry fruit fly. Several other spray compounds and dusts also gave excellent results. The Department found that the cherry fruit fly emergence cage is the most reliable method of timing sprays.

TREE AND SMALL FRUIT STUDIES

Study is in progress on sterility of Bartlett pears; substitute for lead arsenate in the control of diseases and insects attacking fruit crops; spray combinations for control of cherry leaf spot; control of pear scab; development of blight-resistant pear rootstocks; diseases and insects of berries.

VARIETAL TRIALS OF VEGETABLES

Thus far tests have shown Blue Lake beans and Golden Cross Bantam corn to be the best varieties. Of the many varieties of tomatoes tested, Nystate, Pritchard, Bonny Best, and Red Cap are the most desirable.

TOMATO TIP BLIGHT RESISTANCE

Plants that appeared to be resistant to this disease have been selected for four years and a fairly resistant early maturing and late maturing sort have been found. Seed from these selections is now being used widely by the commercial tomato growers in Southern Oregon.

CURLY TOP DISEASE OF VEGETABLES

Definite progress has been made in obtaining resistant bean and squash crops for both dry and canning use. No tomatoes resistant to this disease have yet been found.

TEXAS

54th Annual Report, 1941, Texas Agricultural Experiment Station, College Station.

TOMATO DISEASE RESISTANCE

The Tomato Disease Laboratory at Yoakum reports testing of selections for resistance to wilt and early blight. Work was continued in the Tomato Disease Laboratory at Jacksonville on 96 selections of yellow-flowered, red-fruited tomatoes having the gene for wilt immunity in order to develop

commercially desirable types. Several of the hybrids with Marglobe and Rutgers were practically immune to Fusarium wilt and had the horticultural qualities of these commercial varieties in the fourth generation.

CITRUS STUDIES

At the Weslaco and Winter Garden Station, a number of experiments were carried on with citrus fruits, including soil management studies, citrus varieties and rootstocks, fertilizer tests, and control of diseases and insects.

FRUIT ADAPTABILITY INVESTIGATIONS

At the Nacogdoches Station, work was carried on during 1941 having to do with selecting seedlings of blackberries and dewberries for the purpose of selecting outstanding strains. During the year further material was also assembled for the study of adaptability of fruit varieties in East Texas.

VEGETABLE ADAPTABILITY INVESTIGATIONS

Studies are being carried on at the Weslaco, Nacogdoches, Iowa Park, and Winterhaven substations.

RECENT PUBLICATIONS ON CANNING CROPS

The following circulars and bulletins have been received by the Raw Products Bureau from the Experiment Stations publishing them. Included in the list also are certain articles appearing in scientific journals having a bearing on canners' production problems.

The Raw Products Bureau does not have extra copies of these publications for distribution to members, but in most cases they may be obtained, upon request, from the institutions publishing them.

BEANS

Snap Beans for Marketing, Canning, and Freezing. Farmers Bul. 1915, USDA.

Information is given on cultural and marketing practices, diseases, and insect control.

LIMA BEANS

Spraying and Dusting Experiments with Bush Lima Beans on Long Island for Control of the Mexican Bean Beetle.

Bul. 702, N. Y. State Agric. Exp. Sta., Geneva.

Report is presented of field experiments carried on during the seasons of 1936 to 1941, for the purpose of noting the comparative merits of sprays and dusts containing pyrethrum and rotenone-bearing powders for control of the Mexican bean beetle on lima beans. The study was extended to include tests of fungicidal-insecticidal mixtures containing copper sulfate and copper oxychloride.

BEETS

Boron Deficiency in Garden and Sugar Beet.

Jour. Agric. Res., Feb. 1, 1943.

Reports investigations which have been under way in Wisconsin since 1937, in the greenhouse and at several locations in the field.

Use of Boron in Controlling Canker of Table Beets.

Circ. of Information 283, Ore. Agric. Exp. Sta., Corvallis.

Prevalence of canker in Oregon is discussed and results of experiments reported.

CARROTS

Growing Carrots for Canning and Freezing.

Ext. Circ. 363, Ore. Ext. Serv., Corvallis.

Discusses varieties, cultivation, disease and insect control, harvesting, and yield.

CHERRIES

Cultural Factors Affecting Sour Cherry Production in Colorado.

Bul. 471, Colo. Agric. Exp. Sta., Fort Collins.

Presents results of six years of experimentation and observation on factors affecting production of this crop in commercial areas in north-central Colorado.

CORN

Mineral-Oil Treatment of Sweet Corn for Earworm Control.
Circ. 657, U. S. Dept. of Agriculture.

Discusses habits of corn earworms and use of insecticidal materials and equipment.

Studies on the Prevalence of the European Corn Borer in the East North Central States.

Circ. 649, USDA.

Discusses the field status of the borer, 1934-39, intensity of infestation, association of borer abundance with weather, and effect of weather factors on different stages.

The European Corn Borer in Yield Fields.

Circ. 539, Ill. Coll. of Agric., Urbana.

Suggests methods to follow to prevent serious losses from this insect.

Control of Corn Earworm on Sweet Corn.

Sta. Circ. of Inf. 275, Ore. Agric. Exp. Sta., Corvallis.

Points out certain limitations and precautions to be followed in applying oil treatment.

Status of the European Corn Borer in 1942.

Insect Pest Survey, Dec. 15, 1942 (special supplement).

Reports distribution, fall, spring and summer abundance, and gives data on abundance, by States, and counties, in comparison with 1941.

DISEASE AND INSECT CONTROL

Current Contributions on Insect Control: II.

Bul. 703, N. Y. State Agric. Exp. Sta., Geneva.

Contains information on control of the common red spider on lima beans, substitutes for mercury salts in cabbage maggot control, an alternative insecticide for European corn borer control, use of rotenone-bearing dusts for cabbage insect control, and on control of a number of fruit tree insects.

Controlling Garden and Vegetable Insects in Iowa.

Bul. 10, Iowa Dept. of Agriculture, Des Moines.

Describes a number of insects, how they feed, and methods for controlling them, including formulas for insecticides and methods of application.

The Curly Top Disease of Vegetables in the Pacific Northwest.

Station Circ. of Inf. 278, Ore. Agric. Exp. Sta., Corvallis.

Effect of this disease is described on tomatoes, beans, spinach, beets, peppers, pumpkin and squash. Reports results of tests for varieties resistant to the disease, and suggests practices that may reduce curly top on tomatoes.

Fluorine Compounds Useful in the Control of Insects.

Bul. 182, Tenn. Agric. Exp. Sta., Knoxville.

Brings together the major results of the experimental work since 1924 with the various fluorine compounds, with special reference to sodium fluoride, sodium fluosilicate, and cryolite.

PEAS

Irrigation of Seed and Canning Peas in the Gallatin Valley, Montana.

Bul. 405, Montana Agric. Exp. Sta., Bozeman.

Analyzes data gathered during the period 1934 to 1938 of the effect of various irrigation practices on yield.

Distribution and Relative Importance of Various Fungi Associated with Pea Root-Rot in Commercial Pea-Growing Areas in New York.

Tech. Bul. 264, N. Y. State Agric. Exp. Sta., Geneva.

Reports results of field surveys and laboratory tests made to determine which fungi are causing pea root rot in New

York State, whether the same fungi are causing the disease in all localities, what effect soil and weather conditions have on the prevalence and destructiveness of these fungi, and what soil management practices will do the most to prevent pea root rot.

SOILS AND FERTILIZERS

Effects of Fertilizer Placement on Snap Beans, Lima Beans and Peas.

Bul. 107, Virginia Truck Experiment Station, Norfolk.

Reports results of an experiment made to evaluate some of the various methods of fertilizer application and to determine a safe and efficient way of using relatively large quantities of quickly available nutrients on these three crops.

SOYBEANS

Vegetable Soybeans.

Bul. P39, (new series), Iowa Agric. Exp. Sta., Ames.

Reports results of tests of a large number of vegetable-type soybean varieties in Iowa.

SWEET POTATOES

A Strain of Nancy Hall Sweetpotato Selected for Color of Flesh.

Circ. 80, Tenn. Agric. Exp. Sta., Knoxville.

Cooperative Tests of Sweetpotato Varieties, Introduction, and Seedlings for Starch Production and Market Purposes.

Results are given of the yielding capacity, starch content, and other properties of a considerable number of domestic and introduced varieties and new seedlings tested during the 6-year period from 1934 to 1939.

TOMATOES

Tomatoes by Direct Seeding.

Ext. Bul. 281, Purdue Ext. Serv., Lafayette.

The advantages and disadvantages of this method are discussed, and the methods which have given best results are described.

Late Blight of Tomato.

Sta. Circ. of Inf. 280, Ore. Agric. Exp. Sta., Corvallis.

Symptoms of this disease are described, and methods of control are discussed.

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Raw Products Articles Appearing in *Information Letters*, May-December, 1942

In May, 1942, the Raw Products Bureau issued a bulletin reproducing the material on raw products research activities published in the *INFORMATION LETTERS* from October, 1941 to April, 1942. Since the latter date, additional articles have appeared in the *LETTER*, and for the convenience of those maintaining files of the *LETTER*, the Raw Products Bureau has prepared the following index, covering the May-December, 1942, period. As a considerable proportion of the material was published in supplements to the *INFORMATION LETTER*, the index refers to such reports both by Supplement number and by pages on which the respective items appeared.

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